

# Selection and Influence Effects on Physical Activity in Adolescents' Social Networks

Thabo van Woudenberg



# BIRDS OF A FEATHER: Homophily in Social Networks

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## Associations of friendship and children's physical activity during and outside of school: A social network study

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## Network-Behavior Dynamics of Adolescent Friendships, Alcohol Use, and Physical Activity

Emily Long, Tyson S. Barrett, and Ginger Lockhart  
Utah State University

The physical activity of friends is more similar to each other than to non-friends



# Homophily: Selection or Influence?



## Homophily, Selection, and Socialization in Adolescent Friendships<sup>1</sup>

Denise B. Kandel

*New York State Psychiatric Institute and Columbia University*

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How physical activity shapes, and is shaped by, adolescent friendships

Kayla de la Haye<sup>a,\*</sup>, Garry Robins<sup>b</sup>, Philip Mohr<sup>c</sup>, Carlene Wilson<sup>d</sup>

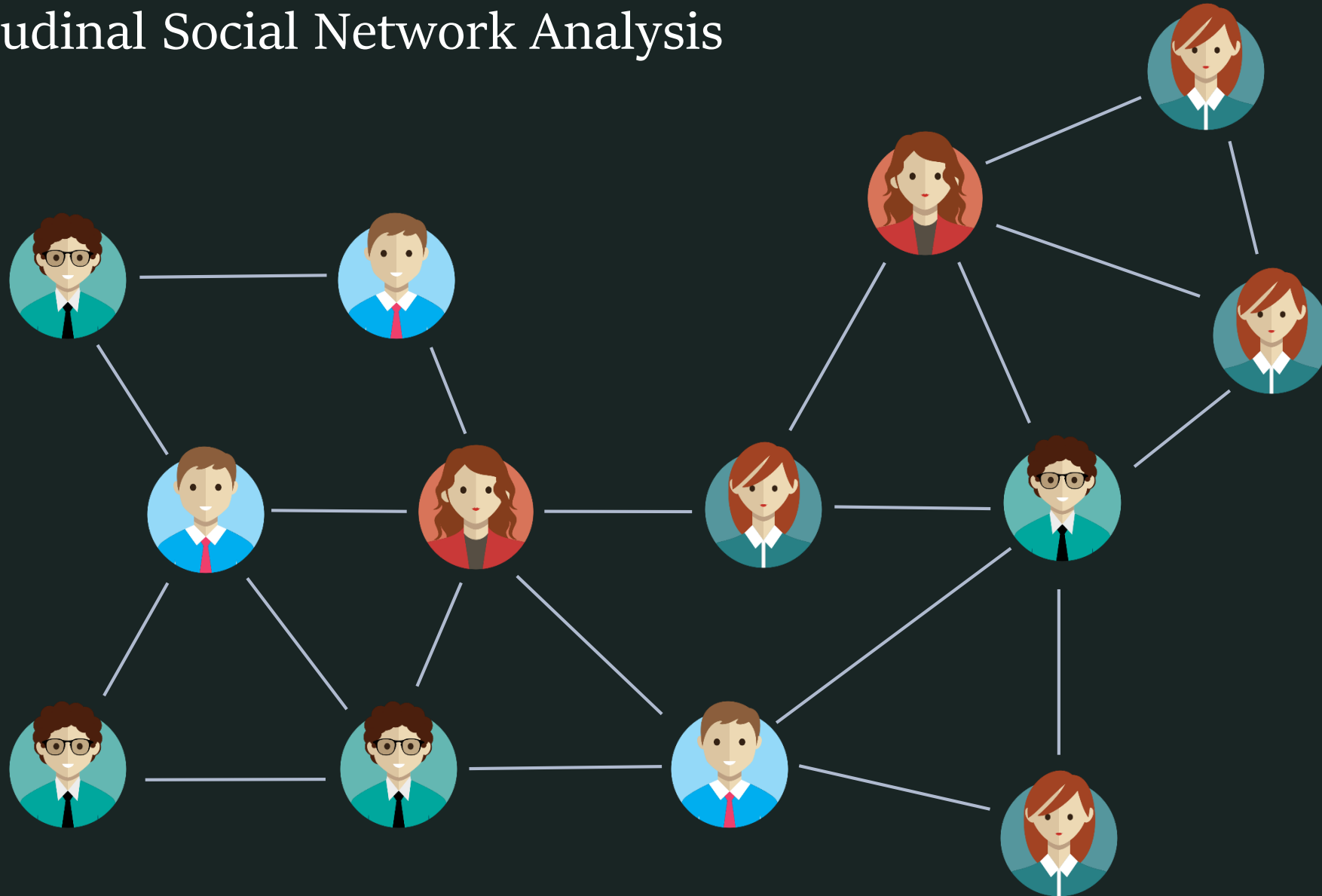
*University of Adelaide and CSIRO Preventative Health Flagship, South Australia, Australia*

*University of Melbourne, Australia*

*CSIRO Food and Nutritional Sciences, Adelaide, Australia*

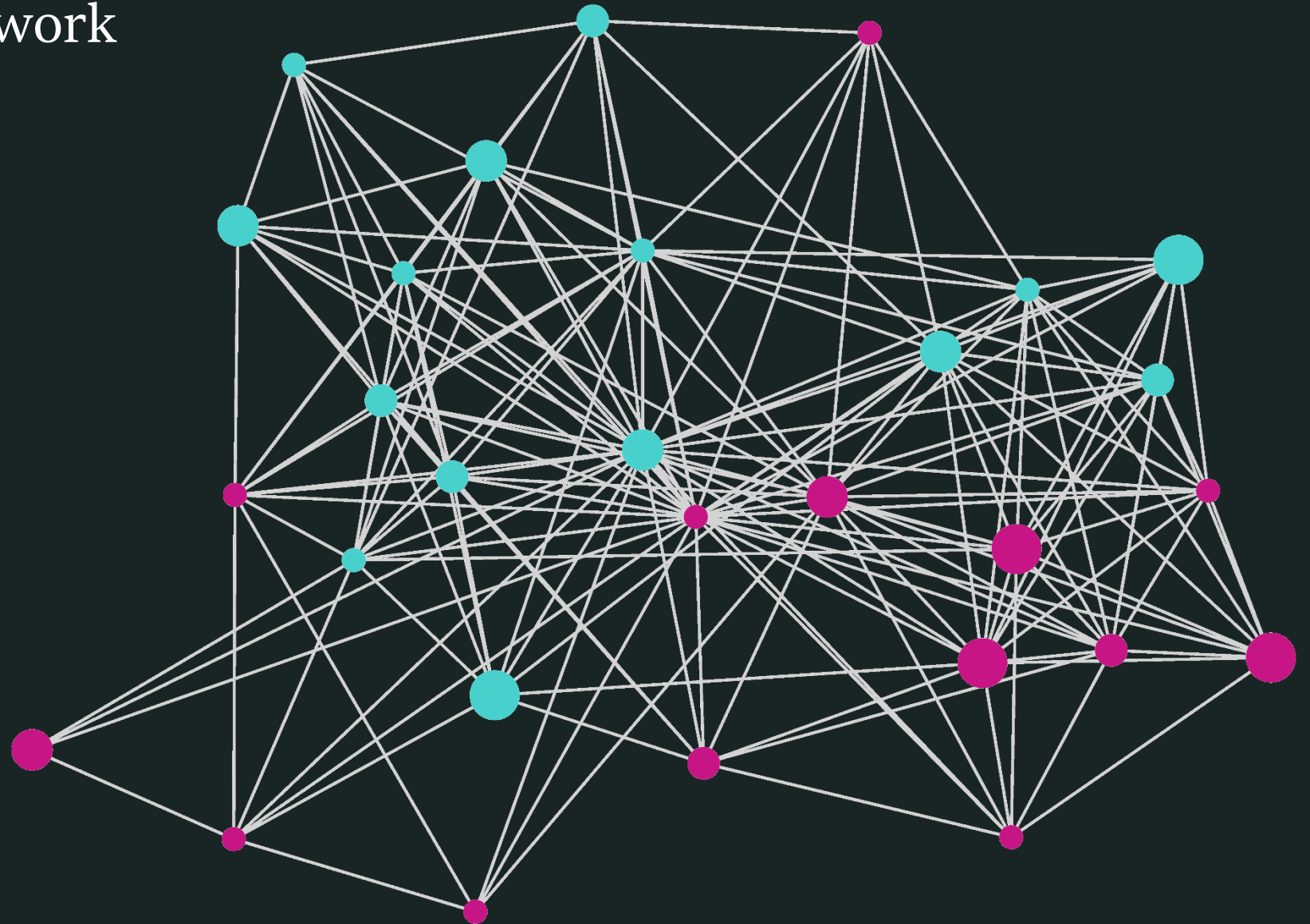
*Flinders University and Cancer Council South Australia, South Australia, Australia*

# Longitudinal Social Network Analysis

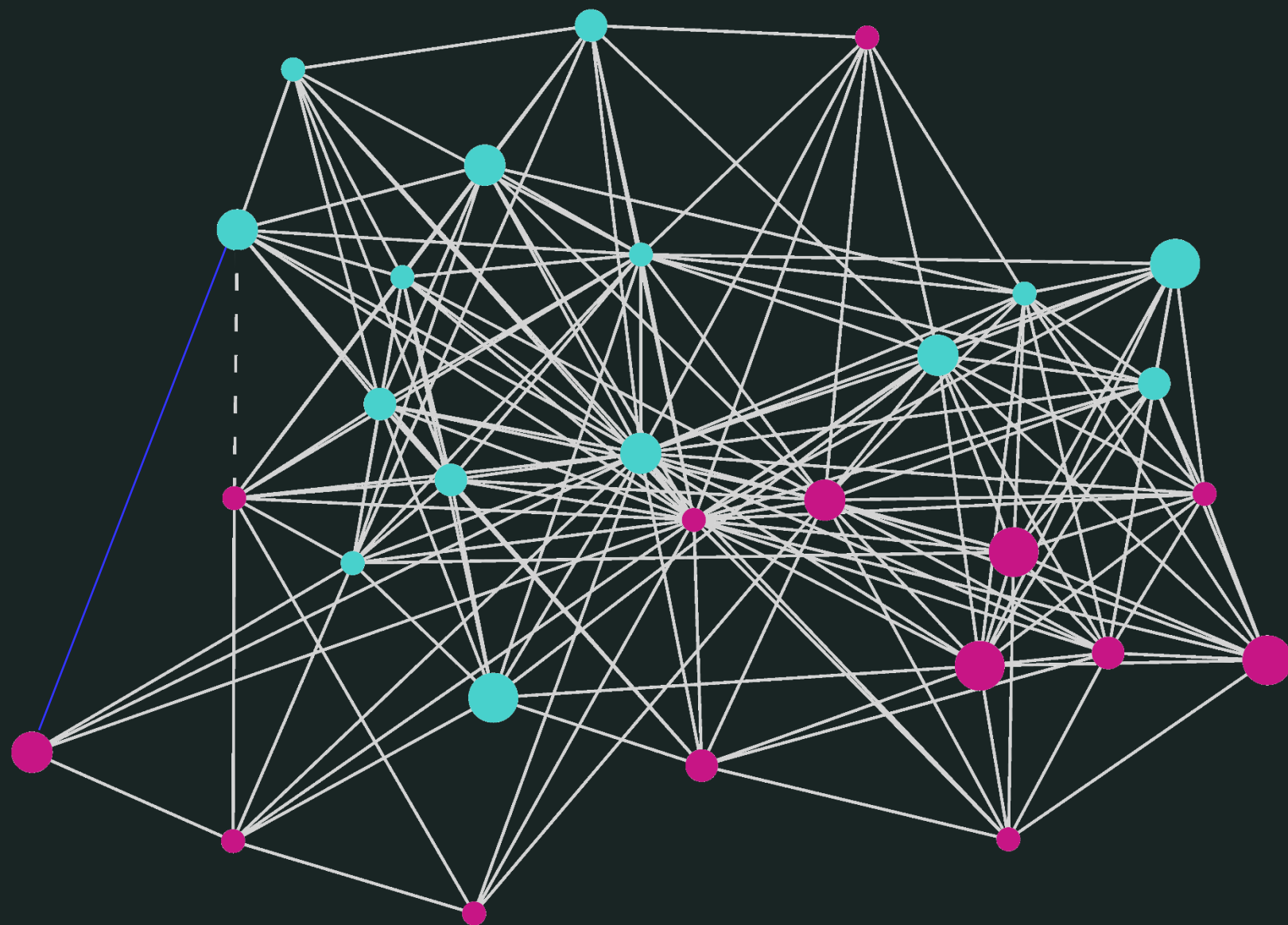




# Friendship social network



Selection:



Influence:



Male



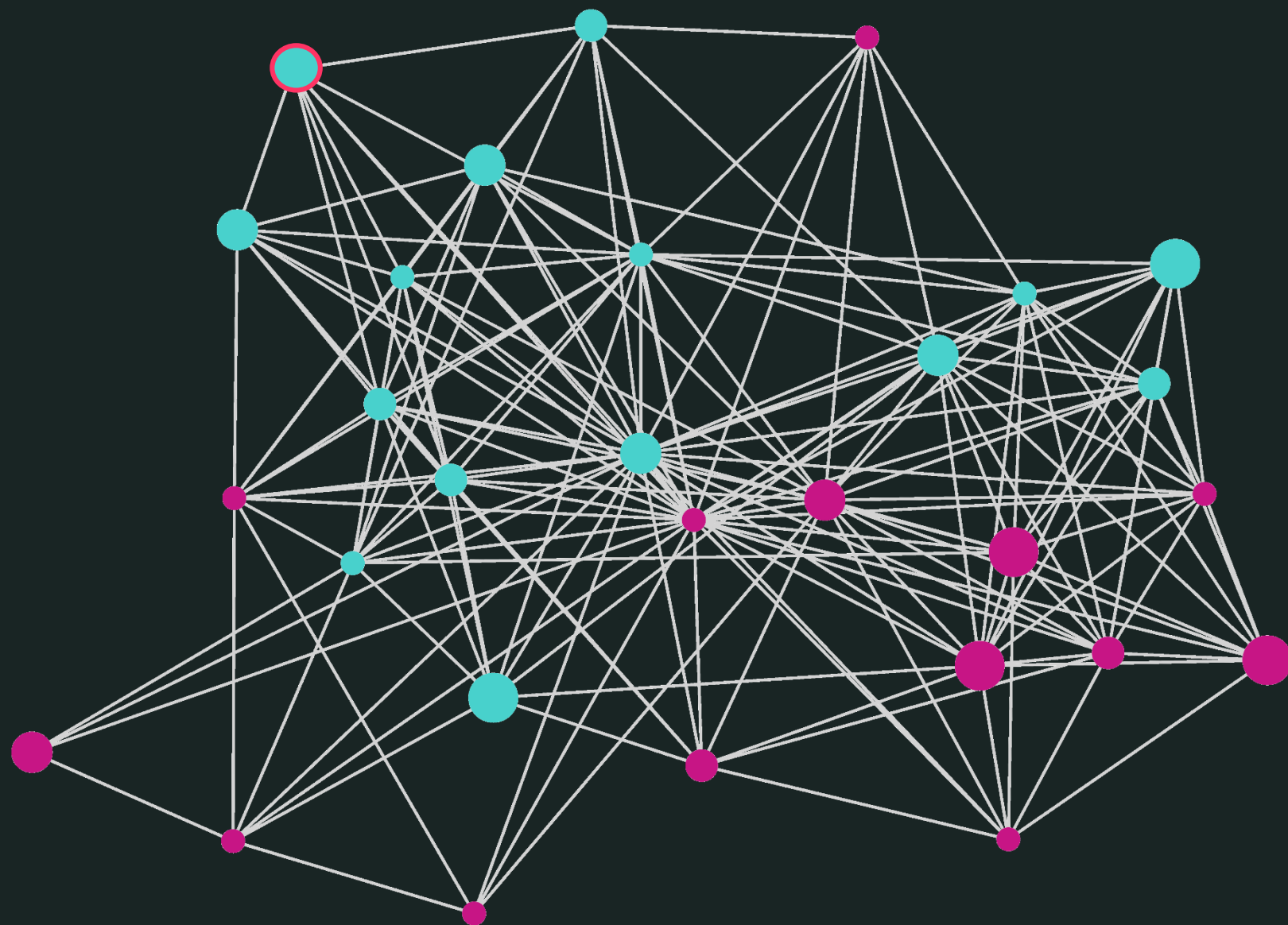
Female



Active



Inactive





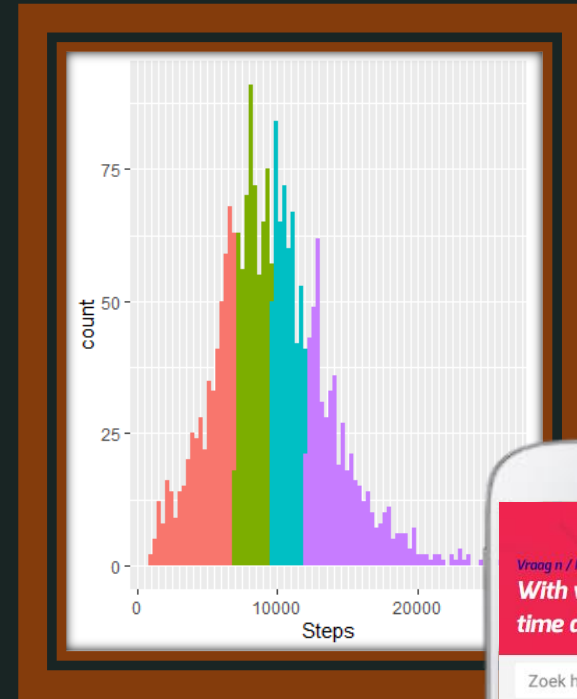
# Sample

$N = 726$

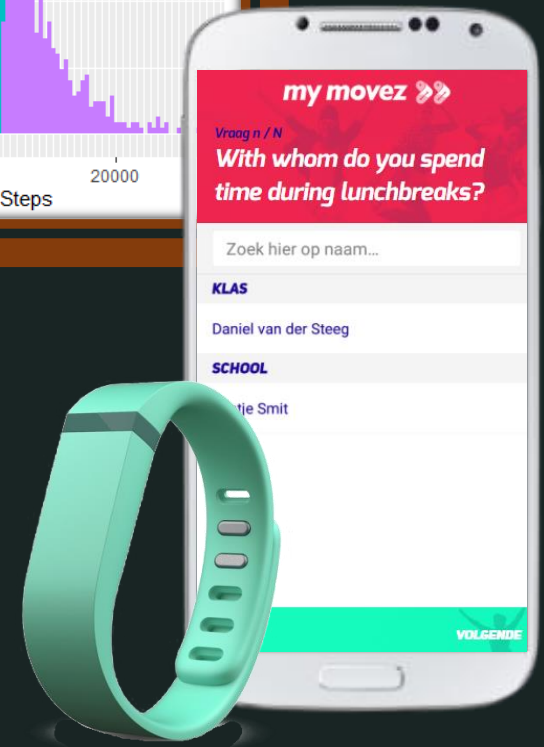
Sex = 47% male

Age = 8-15,  $M = 10,88$  ( $SD = 1,16$ )

38 Classrooms (primary and secondary)



	Feb 2018	Apr 2018	Jun 2018
Social networks	Who are your friends in the classroom?		
Physical activity	Daily number of steps measured by Fitbit Flex		



## Results: Null Model

Name	EffectName	Estimate	SE	T-value	Sig	OR	CI	Prob.
Net	constant Net rate (period 1)	7,23	0,18	39,33	<.001	1.4e+03	[9.6e+02, 2.0e+03]	1
Net	constant Net rate (period 2)	6,51	0,16	39,53	<.001	6.7e+02	[4.9e+02, 9.3e+02]	1
Net	outdegree (density)	-1,1	0,02	-57,75	<.001	3.3e-01	[3.2e-01, 3.5e-01]	0,25
Net	reciprocity	0,13	0,04	3,34	<.001	1.1e+00	[1.1e+00, 1.2e+00]	0,53
Net	transitive recipr. triplets	0,14	0,01	26,04	<.001	1.2e+00	[1.1e+00, 1.2e+00]	0,53
Net	PA alter	-0,02	0,02	-0,87	NA	9.8e-01	[9.5e-01, 1.0e+00]	0,5
Net	PA ego	0,03	0,02	1,29	NA	1.0e+00	[9.9e-01, 1.1e+00]	0,51
Net	PA similarity	0,44	0,12	3,79	<.001	1.6e+00	[1.2e+00, 2.0e+00]	0,61
PA	rate PA (period 1)	4,94	0,53	9,35	<.001	1.4e+02	[5.0e+01, 3.9e+02]	0,99
PA	rate PA (period 2)	5,33	0,57	9,4	<.001	2.1e+02	[6.8e+01, 6.3e+02]	1
PA	PA linear shape	-0,12	0,05	-2,53	.05	8.9e-01	[8.1e-01, 9.7e-01]	0,47
PA	PA quadratic shape	0,19	0,02	7,57	<.001	1.2e+00	[1.1e+00, 1.3e+00]	0,55
PA	PA indegree	0,03	0,01	2,74	.01	1.0e+00	[1.0e+00, 1.0e+00]	0,51
PA	PA outdegree	0	0,01	-0,59	NA	1.0e+00	[9.8e-01, 1.0e+00]	0,5
PA	PA average alter	0,18	0,06	2,89	.01	1.2e+00	[1.1e+00, 1.4e+00]	0,54

## Results: Full Model (controlled for Sex, Age, and zBMI)

Name	EffectName	Estimate	SE	Tvalue	Sig	OR	CI	Prob.
...	...	...	...	...	...	...	...	...
Net	Sex similarity	0,73	0,03	23,17	<.001	2.1e+00	[1.9e+00, 2.2e+00]	0,67
Net	Age similarity	0,3	0,17	1,75	NA	1.4e+00	[9.6e-01, 1.9e+00]	0,57
Net	BMI similarity	-0,33	0,13	-2,45	.05	7.2e-01	[5.6e-01, 9.4e-01]	0,42
Net	PA similarity	0,23	0,14	1,65	NA	1.3e+00	[9.6e-01, 1.6e+00]	0,56
...	...	...	...	...	...	...	...	...
PA	PA: effect from Sex	-0,05	0,04	-1,22	NA	9.5e-01	[8.8e-01, 1.0e+00]	0,49
PA	PA: effect from Age	-0,03	0,02	-1,39	NA	9.7e-01	[9.4e-01, 1.0e+00]	0,49
PA	PA: effect from BMI	-0,04	0,02	-2,06	.05	9.6e-01	[9.3e-01, 1.0e+00]	0,49
PA	PA average alter	0,15	0,06	2,31	.05	1.2e+00	[1.0e+00, 1.3e+00]	0,54

## Conclusion:

Birds of a feather flock together, at least based on:

Sex

zBMI

Flocking birds influence each other's physical activity

## Discussion

Physical activity in categories

Collapsed network

